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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,015	03/31/2004	Bruno Kristiaan Bernard De Man	146389-2	.9547

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
PATENT DOCKET RM. BLDG. K1-4A59
NISKAYUNA, NY 12309

EXAMINER	
SANEI, MONA M	

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 03/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/816,015	BERNARD DE MAN ET AL.	
	Examiner	Art Unit	
	Mona M. Sanei	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 1 and 41 are objected to because of the following informalities, which appear to be minor draft errors including grammatical and/or lack of antecedent basis problems.

In the following format (location of objection; suggestion for correction), the following correction(s) may obviate the objection(s):

- Claim 1, line 3, replace "an" with - -the- -.
- Claim 41, line 2, replace "sources arranged" with - -sources- -.

For purposes of examination, the claims have been treated as such. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 15, 17, 18, 23-27, 29, 30, 35-37, 39-41, 43, and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Burke et al. (5,305,363).

Regarding Claim 1, Burke et al. discloses a system comprising one or more distributed X-ray sources [(ring tube, Col. 4, line 51; Figs. 1, 2, 4, and 7, "I"), (anode, Col. 4, line 60; Figs. 3 and 7-9, "B"), and (cathode, Col. 4, line 62; Figs. 2, 3, and 7-9, "C")] substantially surrounding (toroidal x-ray tube, Col. 2, lines 28-45; Figs. 1-9) an imaging volume (central bore, Col. 5, line 17; Figs. 2-4 and 7-8,

#26) configured to generate X-ray radiation (x-ray beam, Col. 5, line 14; Figs. 2, 6, 7, and 9, #22) towards the imaging volume;

one or more detectors (ring of detectors, Col. 8, lines 37-38; Figs. 2, 6, 7, and 9, #130) for receiving the X-ray radiation (x-ray beam, Col. 5, line 14; Figs. 2, 6, 7, and 9, #22) after attenuation in the imaging volume and processing corresponding signals to produce volumetric data [(volume image data, Col 9, line 12), (volume imaging means, Col. 8, line 55; Fig. 1, #134), (image reconstruction means, Col. 18, lines 41-45) and (Col. 12, lines 21-23)]; and

a source controller for triggering one or more emitters in the one or more distributed X-ray sources for acquiring volumetric data by the one or more detectors [(Col. 3, lines 1-8) and (Col. 3, lines 47-52)],

wherein the distributed X-ray sources and/or the detectors are arranged about a scanner aperture such that at least one of the X-ray sources or detectors rotate in relation to the imaging volume during an imaging sequence [(rotating cathode assembly, Col. 2, lines 60-64) and (rotating detectors, Col. 9, lines 61-63)].

Regarding Claim 37, Burke et al. discloses a system comprising one or more distributed X-ray sources [(ring tube, Col. 4, line 51; Figs. 1, 2, 4, and 7, "I"), (anode, Col. 4, line 60; Figs. 3 and 7-9, "B"), and (cathode, Col. 4, line 62; Figs. 2, 3, and 7-9, "C")] substantially surrounding (toroidal x-ray tube, Col. 2, lines 28-45; Figs. 1-9) an imaging volume (central bore, Col. 5, line 17; Figs. 2-4 and 7-8, #26) and configured to emanate an X-ray radiation (x-ray beam, Col. 5, line 14; Figs. 2, 6, 7, and 9, #22);

a control circuit operably coupled to the distributed X-ray sources (Col. 3, lines 47-52);

one or more detectors (ring of detectors, Col. 8, lines 37-38; Figs. 2, 6, 7, and 9, #130) for receiving the X-ray radiation (x-ray beam, Col. 5, line 14; Figs. 2, 6, 7, and 9, #22) after attenuation in the imaging volume;

a source controller for triggering one or more emitters in the one or more distributed X-ray sources for acquiring volumetric data by the one or more detectors [(Col. 3, lines 1-8) and (Col. 3, lines 47-52)],

a motor controller configured to displace at least one of the distributed X-ray sources, and the detectors [(rotating cathode assembly, Col. 3, line 63 to Col. 4, line 2) and (rotating detectors, Col. 3, lines 26-33)];

a processing circuit (volume imaging means (image reconstruction means), Col. 8, line 55; Fig. 1, #134), operably coupled to the detectors (Col. 2, lines 41-45) configured to receive the plurality of projection images and to form one or more reconstructed slices representative of the volume being imaged; and

an operator workstation (video monitor, Col. 9, line 9; Fig. 1, #138) operably coupled to the processing circuit configured to display the one or more reconstructed slices,

wherein the distributed X-ray sources and/or the detectors are arranged about a scanner aperture such that at least one of the X-ray sources or detectors rotate in relation to the imaging volume during an imaging sequence [(rotating cathode assembly, Col. 2, lines 60-64) and (rotating detectors, Col. 9, lines 61-63)].

Regarding Claim 41, Burke et al. discloses a method comprising providing one or more distributed X-ray sources [(ring tube, Col. 4, line 51; Figs. 1, 2, 4, and 7, "I"), (anode, Col. 4, line 60; Figs. 3 and 7-9, "B"), and (cathode, Col. 4, line 62; Figs. 2, 3, and 7-9, "C")] substantially surrounding (toroidal x-ray tube, Col. 2, lines 28-45; Figs. 1-9) an imaging volume (central bore, Col. 5, line 17; Figs. 2-4 and 7-8, #26);

providing one or more detectors (ring of detectors, Col. 8, lines 37-38; Figs. 2, 6, 7, and 9, #130) for receiving the X-ray radiation (x-ray beam, Col. 5, line 14; Figs. 2, 6, 7, and 9, #22) after attenuation;

providing a source controller for triggering one or more emitters in the one or more distributed X-ray sources for acquiring volumetric data by the one or more detectors [(Col. 3, lines 1-8) and (Col. 3, lines 47-52)],

wherein generating and receiving the X-ray radiation is accomplished by rotating at least one of the distributed X-ray sources and detectors in relation to the imaging volume during an imaging sequence [(rotating cathode assembly, Col. 2, lines 60-64) and (rotating detectors, Col. 9, lines 61-63)].

Regarding Claims 27, 39, and 43, Burke et al. discloses a system and method wherein the one or more distributed X-ray sources comprises at least one distributed source configured to rotate around the scanner aperture (rotating cathode assembly, Col. 2, lines 60-64) and the one or more detectors comprises at least one distributed detector configured to rotate around a scanner aperture (rotating detectors, Col. 9, lines 61-63).

Regarding Claims 15, 40, and 44, Burke et al. discloses a system and method wherein the one or more distributed X-ray sources comprises at least one distributed source configured to rotate around the scanner aperture (rotating cathode assembly, Col. 2, lines 60-64) and the one or more detectors comprises at least one stationary and distributed detector positioned about the scanner aperture [(see abstract) and (Col. 8, lines 37-40)].

Regarding Claims 17, 18, 29, and 30, Burke et al. discloses a system wherein the one or more distributed X-ray sources includes one or more one-dimensional arrays of source elements extending substantially around the aperture, therefore necessarily extending around a portion (Figs. 2-9).

Regarding Claims 23-26, 35, and 36, Burke et al. discloses a system wherein the at least one stationary [(see abstract) and (Col. 8, lines 37-40)] distributed detector includes one two-dimensional array (Col. 8, lines 37-55), therefore necessarily a plurality of one-dimensional arrays, of detector

elements extending substantially around the aperture, therefore necessarily extending around at least a portion of the aperture (Figs. 2, 6, 7, and 9).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 2, 5, 8-10, 38, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burke et al. as applied to Claims 1, 37, and 41 above, and further in view of Richey et al. (4,547,892).

Regarding Claims 2, 38, and 42, Burke et al. discloses all the characteristic features of the present invention as recited above.

However, Burke et al. fails to disclose a system comprising a stationary x-ray source.

Richey et al. discloses a system (Col. 2, lines 6-8) comprising a stationary x-ray source (Col. 5, lines 46-48).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system and method disclosed by Burke et al. by incorporating the feature disclosed by Richey et al.

One would have been motivated to make this modification because the flux of incident x-rays on the object remains constant, thus reducing rotational error.

Regarding Claims 5 and 8, Burke et al. discloses a system wherein the one or more distributed X-ray sources includes one or more one-dimensional arrays of source elements extending substantially around the aperture, therefore necessarily extending around a portion (Figs. 2-9).

Regarding Claims 9 and 10, Burke et al. discloses a system wherein the at least one stationary [(see abstract) and (Col. 8, lines 37-40)] distributed detector includes one two-dimensional array (Col. 8, lines 37-55), therefore necessarily a plurality of one-dimensional arrays, of detector elements extending substantially around the aperture, therefore necessarily extending around at least a portion of the aperture (Figs. 2, 6, 7, and 9).

3. Claims 3, 4, 12-14, 16, and 28 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Burke et al. and Rickey et al. as applied to Claims 2, 15, and 27 above, and further in view of Price et al. (2002/0085674).

Regarding Claims 3, 4, 16, and 28, Burke et al. as modified above discloses all the characteristic features of the present invention as recited above.

However, Burke et al. fails to disclose a system wherein one or more distributed x-ray sources include a two-dimensional array.

Price et al. discloses a system wherein one or more distributed x-ray sources include a two-dimensional array ([0025], lines 1-2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system suggested by Burke et al. as modified above by incorporating the features disclosed by Price et al.

One would have been motivated to make this modification in order to accommodate higher energy levels used to generate the electrons ([0025], lines 1-13) as implied by Price et al.

Regarding Claims 12 and 14, Burke et al. discloses all the characteristic features of the present invention as recited above.

However, Burke et al. fails to disclose a system wherein the one or more distributed x-ray sources includes a plurality of independently addressable source elements arrange in one or more arrays, wherein the addressable emission devices comprise a cold-cathode emitter.

Price et al. discloses a system wherein the one or more distributed x-ray sources ([0015], lines 4-5) includes a plurality of independently addressable source elements ([0017], lines 1-4) arranged in an array ([0025], lines 1-2), wherein the addressable emission devices comprise a cold-cathode emitter ([0026], Claim 1, lines 5-7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system suggested by Burke et al. as modified above by incorporating the feature disclosed by Price et al.

One would have been motivated to make this modification because the elements can be energized simultaneously as well as at certain times, therefore increasing the efficiency of the system ([0025], lines 1-13) as implied by Price et al.

Regarding Claim 13, Burke et al. discloses all the characteristic features of the present invention as recited above. Burke et al. further discloses a stationary anode disposed in a vacuum housing (Col. 5, lines 12-25).

However, Burke et al. fails to disclose a system wherein the one or more distributed x-ray sources comprise a cold cathode emitter housed in a vacuum housing wherein a stationary anode is disposed in a vacuum housing is spaced apart from the cold cathode emitter.

Price et al. discloses a system wherein the one or more distributed x-ray sources ([0015], lines 4-5) comprises a cold cathode emitter housed in a vacuum housing ([0026], Claim 1, lines 2-3), wherein a stationary anode ([0007], lines 1-2) is disposed in a vacuum housing and spaced apart from the cold cathode emitter ([0026], Claim 1, lines 5-7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system suggested by Burke et al. as modified above by incorporating the feature disclosed by Price et al.

One would have been motivated to make this modification in order to accommodate a more effective interface for transmitting the image to a remote diagnostic facility ([0008], lines 10-15) as implied by Price et al.

4. Claims 6, 11, 19, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burke et al. and Richey et al. as applied to Claims 2, 5, 18, and 30 above, and further in view of Zunick (2,340,500).

Burke et al. as modified above suggests all the characteristic features of the present invention as recited above.

However, Burke et al. fails to disclose a system comprising one or more line sources.

Zunick discloses system comprising one or more line sources ("line" source, Col. 2, line 28).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system suggested by Burke et al. as modified above by incorporating the feature disclosed by Zunick.

One would have been motivated to make this modification in order to minimize target deformation or curling (Col. 1, lines 18-19) as implied by Zunick.

5. Claims 7, 20, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burke et al. and Richey et al. as applied to Claims 5, 18, and 30 above, and further in view of Price et al. and Zunick.

Burke et al. as modified above suggests all the characteristic features of the present invention as recited above.

However, Burke et al. fails to disclose a system wherein or more distributed x-ray source include a two-dimensional array. Burke et al. further fails to disclose one or more line sources.

Price et al. discloses a system wherein one or more distributed x-ray sources include a two-dimensional array ([0025], lines 1-2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system suggested by Burke et al. as modified above by incorporating the features disclosed by Price et al.

One would have been motivated to make this modification in order to accommodate higher energy levels used to generate the electrons ([0025], lines 1-13) as implied by Price et al.

Zunick discloses one or more line source ("line" source, Col. 2, line 28).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system suggested by Burke et al. as modified above by incorporating the feature disclosed by Zunick.

One would have been motivated to make this modification in order minimize target deformation or curling (Col. 1, lines 18-19) as implied by Zunick.

6. Claims 21 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burke et al. as applied to Claims 17 and 29 above, and further in view of Zunick and Dawson et al. (5,467,377)

Burke et al. discloses all the characteristic features of the present invention as recited above.

However, Burke fails to disclose a line source extending at least along a Z-direction.

Zunick discloses a line source ("line" source, Col. 2, line 28).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system disclosed by Burke et al. by incorporating the feature disclosed by Zunick.

One would have been motivated to make this modification in order minimize target deformation or curling (Col. 1, lines 18-19) as implied by Zunick.

Dawson et al. discloses an x-ray source extending at least along a Z-direction (Fig. 3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system suggested by Burke et al. as modified above by incorporating the feature disclosed by Dawson et al.

One would have been motivated to make this modification because the system can easily generate several sequential z-axis slices of information without physically moving (Col. 1, lines 44-49) as implied by Dawson et al.

7. Claims 22 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burke et al., Zunick, and Dawson et al. as applied to Claims 21 and 33 above, and further in view of Baker et al. (5,259,012).

Burke et al. as modified above suggests all the characteristic features of the present invention as recited above.

However, Burke fails to disclose a line source comprising a target configured as a hollow cylinder rotating around an axis of the hollow cylinder.

Baker et al. discloses a line source comprising a target configured as a hollow cylinder rotating around an axis of the hollow cylinder (Col. 9, lines 56-62; Figs. 5a and 5b).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system suggested by Burke et al. as modified above by incorporating the feature disclosed by Baker et al.

One would have been motivated to make this modification because the increased exposed surface area of the target promotes the amount incident x-rays.

Response to Arguments

Applicant's arguments with respect to claims 1-44 have been considered but are moot in view of the new ground(s) of rejection. Applicant's arguments filed 12/21/2005 have been fully considered but they are not persuasive.

Regarding Burke et al., applicant argues that Burke et al. fails to disclose volumetric data and a source control for triggering one or more emitters.

Examiner respectfully disagrees.

Burke et al. does disclose volumetric data [(volume image data, Col 9, line 12), (volume imaging means, Col. 8, line 55; Fig. 1, #134), (image reconstruction means, Col. 18, lines 41-45) and (Col. 12, lines 21-23)] and a source control for triggering one or more emitters [(Col. 3, lines 1-8) and (Col. 3, lines 47-52)].

In conclusion, applicant's arguments are not persuasive.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mona M. Sanei whose telephone number is (571) 272-8657. The examiner can normally be reached on Monday through Friday, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mona Sanei

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SUPERVISORY PATENT EXAMINER